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IMPERIAL BUREAU OF MYCOLOGY
21 JUL 1923

**IMPERIAL
DEPARTMENT OF AGRICULTURE
FOR THE WEST INDIES.**



**REPORT
ON THE
AGRICULTURAL DEPARTMENT
ANTIGUA,**

1921-22.

BARBADOS.

**ISSUED BY THE IMPERIAL COMMISSIONER OF AGRICULTURE
FOR THE WEST INDIES.**

1922.

[Price Sixpence.]



REPORTS
ON THE
BOTANIC STATION, ECONOMIC
PLOTS, AND AGRICULTURAL
EDUCATION, ANTIGUA

Annual Reports on Certain Economic Experiments conducted in connexion with
the Botanic Station, 1900-2.

Annual Reports on the Botanic Station for the years 1901 and 1902.

Annual Reports on the Botanic Station, Economic Experiments, and Agricultural
Education for the years 1902-3 to 1921-22.

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DEPARTMENT OF AGRICULTURE
FOR THE WEST INDIES.



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LETTER OF TRANSMITTAL.

The Imperial Commissioner of Agriculture—to Colonial Secretary, Antigua.

No A. 1134

West Indian Agricultural College,

Trinidad,

May 15th, 1923.

Sir,

I have the honour to forward the Report of the Agricultural Department, Antigua, for the year ended 31st March 1922.

2. Much useful work appears to have been accomplished by the introduction of new grasses and fodder plants.

3. Cotton selection has been carefully attended to. The reported discovery and spread of the Pink Bollworm is to be regretted. Improved cultural methods, careful fumigation of seed and a strict observance of the close season seem to be the only methods of control at the present time.

4. Unfortunately the weather conditions during the year were most unfavourable to plant growth and crops generally were poor. It has been the worst year experienced by the Central Factory, so far as the supply of canes is concerned.

5. The increase in the output of the Onion Industry is satisfactory.

6. The report generally indicates that useful work continues to be maintained and that the Department is of practical utility to the Agricultural Community.

I have the honour to be,

Sir,

Your most obedient servant,

(Sgd.) FRANCIS WATTS,

Commissioner of Agriculture
for the West Indies.

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STAFF OF THE AGRICULTURAL DEPARTMENT, ANTIGUA. 1921-22.

Agricultural Superintendent	F. G. HARCOURT, F.R.H.S.
Land Officer and Agricultural Instructor	E. S. ELDRIDGE.
1st Assistant for Agricultural Experiments	Vacant.
2nd Assistant for Agricultural Experiments	A. C. THOMPSON.
Clerk	MISS G. EDWARDS.

REPORT ON THE BOTANIC AND EXPERIMENT STATIONS, ANTIGUA.

For the Year ended March 31, 1922.

WORK IN THE BOTANIC GARDENS AND OBSERVATIONS ON PLANTS.

Work in the Gardens was seriously hampered by continued dry weather during the year under report, only 36.88 inches were recorded for the calendar year, and 36.09 for the Departmental year, i.e., April 1921 to March 1922.

For about four months the water-supply from the municipal water system was cut off, and labourers had to be employed in carting water from neighbouring ponds in the attempt to save as many plants as possible.

No improvements of great importance were carried out, the work in the gardens being of a general routine nature, coupled with the effort to save specimen plants from succumbing to the drought.

The gardens were maintained in good order, the following flowering plants proving very attractive during their respective flowering seasons:—*Cassia fistula*, *Bougainvillea glabra* var. *Cypheri* and var. *sanderiana*, *Plumbago capensis*, *Ixora splendens* and *Allamanda Schottii* var. *Hendersoni*.

Having experienced good rains during September October and November, the decorative beds on the eastern lawns were planted with Lantana, Zinnias, Cosmos and Balsams. These beds, and the hedge of *Plumbago capensis* which surrounds them, were a mass of colour in January, and were greatly admired by visitors.

WORK IN THE NURSERIES AND DISTRIBUTION OF PLANTS.

The nurseries were maintained in good order, but propagating work was seriously hampered by continuous dry weather and although water was carted to the nursery, it was impossible to save more than about 50 per cent. of the plants.

PLANTING MATERIAL.

The demand for plants, with the exception of onion seedlings, was not great but was in advance of that for the previous year.

The following table shows the distribution of planting material.

DISTRIBUTION OF PLANTING MATERIAL.

PLANTS AND SEEDLINGS.

Onion	...	...	...	...	69,600
Pine Apple	...	...	...	...	57
Papaw	...	...	...	...	66
Guava	...	...	...	...	62
Mahogany	...	...	...	...	262
Cordia interrupta	...	...	...	...	151
Eucalyptus	...	...	...	...	125
Whitewood	—	...	...	...	27
Miscellaneous Decorative	...	...	...	...	127
Miscellaneous Economic	...	...	...	...	40

SEEDS.

Onion	...	...	...	...	406 $\frac{1}{4}$ lb.
Black-eye Peas	...	...	...	...	932 lb.
Guinea Corn	...	...	...	...	92 lb.
Maize	...	...	...	...	5 $\frac{3}{4}$ lb.
Teosinte	—	...	...	...	2 $\frac{1}{2}$ lb.
Sudan Grass	...	...	...	...	3 $\frac{1}{4}$ lb.
Sunflower seeds	...	...	...	...	10 lb.
Pithecolobium unguis-cati	...	...	...	...	5 lb.
Vegetable seeds	...	...	...	...	56 pkts.
Flower seeds	...	...	...	...	18 pkts.
Miscellaneous seeds	...	...	...	...	4 pkts.
Cotton seeds (on behalf of A. C. G. A.)	...	...	...	...	288 $\frac{3}{4}$ lb.

CUTTINGS.

Sweet Potato	...	...	...	...	26,000
Sugar cane varieties	...	...	...	...	43,680
Elephant grass	...	...	...	...	2,621
Tripsacum laxum	...	...	...	...	110
Miscellaneous	...	...	...	...	150

OTHER PLANTING MATERIAL.

Yams	...	...	...	...	500 lb.
Eddoes	...	...	...	...	260 lb.
Potatoes	...	...	...	...	4 barrels.
Tube rose bulbs	...	...	...	...	1 dozen.

EXPORTS AND PLANT IMPORTATIONS.

EXPORTS.

The following table shows the agricultural products exported from the Island during the year 1921.

Article.	Quantity.	Value.
		£ s. d.
Sugar (Crystals)	9,754 tons.	264,641 0 0
Sugar (Muscovado)	1,133 „	22,660 0 0
Molasses	1,010 puncheons.	2,250 0 0
Cotton	466 bales.	6,357 0 0
Tamarinds	80 casks.	140 0 0
Lime Juice	83 „	221 0 0
Green Limes	29 barrels.	17 0 0
Onions	3,082 crates.	2,019 0 0
Pine-apples	9 barrels.	10 0 0
Oranges	3 „	3 0 0
Vegetables	to the value of	171 0 0
Hides and Skins	„ „ „ „	795 0 0
Turtle shells	„ „ „ „	119 0 0
<i>Live Stock :—</i>		
Horses	2 head.	45 0 0
Donkeys	to the value of	79 15 0

PLANT AND SEED IMPORTATIONS.

The following varieties of coco-nuts were received from the Imperial Commissioner of Agriculture, with a view of getting together a collection of the best varieties grown in different parts of the world, and to note the commercial possibilities of these varieties in the West Indies :—

West Coast Green variety.

Niobar „

Red, Yellow and Green varieties.

Unfortunately, the nuts were received in a very dry condition and several of them had germinated on the voyage ; consequently very poor results were obtained. Only one Red and one Yellow variety germinated. These two have been planted on Yepton's estate, where it is hoped to start an experimental nursery. Other varieties are expected for trial.

Two bags of cuttings of Elephant grass (*Pennisetum purpureum*) were imported from the Curator, St. Kitts, for trial in Antigua. (See p. 6.)

Tubers of Jerusalem Artichoke (*Helianthus tuberosus*) were imported for trial at the Experiment Station, from Messrs. Barr & Sons, England. These have given good results and are being distributed for further trial.

PLOT EXPERIMENTS.

Seeds of the following varieties of Tobacco, *Nicotiana rustica*, *Nicotiana* var. Kentucky Yellow Pryor, were received from the United States Department of Agriculture, through the Superintendent of Agriculture. These, with other varieties, will be grown to provide material for the Government Chemist & Superintendent of Agriculture, who is conducting experiments to ascertain the nicotine content of the various types of tobacco grown.

PLOT EXPERIMENTS AT THE BOTANIC AND EXPERIMENT STATIONS.

YAMS.

As in previous years, small plots of different varieties of yams were grown for the purpose of supplying planting material for distribution.

Poor yields were obtained owing to the continuous dry weather. The following table shows the results obtained.

Variety.	Area of Plot in acres.	Weight per Plot in lb.	Calculated Weight per acre in lb.
Crop ...	3/160	227½	12,133
Danish ...	3/160	192	10,240
Oriental ...	1/80	123½	9,880
Bottle Neck ...			
Lisbon (Plot robbed) ...	3/160	167	8,907
Lisbon ...	3/160	150	8,000
Stal Top ..	3/160	146	7,787
Horn ...	1/80	95	7,600
Light Red ...	3/160	106	5,653
Bugle Horn ...	3/160	58	3,093

EDDOES & TANNIAS.

Plot experiments were conducted with this crop on similar lines to those of previous years.

ROOT CROPS AND ONIONS.

The following table shows the yields obtained and the calculated yield per acre.

Variety.	Area of Plot in Acres.	Weight per Plot in lb.	Calculated Weight per acre in lb.
Tannia Blanca ...	1/80	62½	5,400
Tannia Yellow ...	1/80	53	4,240
Red Eddoe ...	1/80	49½	3,960
Eddoe Dasheen ...	1/160	22½	3,600
Tannia Roliza ...	1/80	35½	2,840
White Eddoe ...	1/160	17	2,720
Tannia White ..	1/160	17	2,720
Tannia Islena ...	1/160	15½	2,480
Tannia Priete ...	1/160	13	2,080
Tannia Roliza White (Plot robbed) ...	1/80	4½	360

SWEET POTATOES.

Two plots, each $\frac{1}{20}$ -acre, were planted with good varieties of the above crop for the purpose of providing cuttings for distribution.

The Department was able to give valuable assistance to peasant growers, whose crops were seriously affected by scarabee, influencing them to burn off affected areas, which were subsequently planted with healthy cuttings supplied by the Department free of charge.

ONIONS.

An experiment with Nitrapo in the cultivation of Onions was carried out on two plots, each $\frac{1}{40}$ -acre in extent.

Nitrapo was applied to one plot at the rate of 300 lb. per acre, and to the other at 200 lb. per acre.

For purposes of comparison, two other plots of the same area were planted in onions, one receiving a dressing of pen manure and the other left unmanured.

Each of the four plots contained eight beds, and 330 seedlings were planted in each bed.

Plot No. 1. (Nitrapo @ 300 lb per acre.)

A dressing of 3lb. of Nitrapo was well mixed with the soil on October 26, 1921, and the onion seedlings were planted out on November 7 and 8.

A top dressing of 2½ lb. Nitrapo was applied on November 28 and a second top dressing, also 2½ lb., on January 3, 1922.

On reaping, this plot yielded 409 lb. of onions equivalent to 16,360 lb. per acre.

Plot No. 2. (Nitrapo at 200 lb. per acre.)

This plot was treated with Nitrapo and planted on the same dates as Plot No. 1, but the first dressing was 2 lb. Nitrapo, and the second and third 1½ lb. each

ONION EXPERIMENTS AND GRASSES

This plot yielded 399 lb. of onions, or the equivalent of 15,960 lb. per acre.

Plot No. 3. (Treated with Pen Manure.)

This plot was treated with $1\frac{1}{2}$ hogsheads of pen manure, applied broadcast

On reaping, it yielded 309 lb. of onions, amounting to 12,360 lb. per acre.

Plot No. 4. (Unmanured.)

This plot yielded 240 lb. of onions, equal to 9,600 lb. per acre.

Experiments on a small scale were also conducted at Gambles and Parry's estates.

The following are the results obtained.

GAMBLES.

Plot treated with Nitrapo gave 6,574 lb. per acre.

Plot left unmanured gave 5,190 lb. „ „

PARRYS.

Plot No. 1. ($\frac{1}{10}$ acre). Natural manure mixed in surface soil, and a couple weeks later 2 lb. Nitrapo as a top dressing. Yield, 6,800 lb. per acre.

Plot No. 2. ($\frac{1}{20}$ acre) 5 lb. Nitrapo mixed with soil and a couple weeks later 2 lb. Nitrapo as a top dressing. Yield, 7,500 lb. per acre.

Plot No 3. ($\frac{1}{40}$ acre). 2 lb. Nitrapo as a top dressing. (This plot was planted a little earlier) Yield, 9,200 lb. per acre.

Plot No 4. ($\frac{1}{40}$ acre) Watered with washings of Nitrapo bag Yield, 8,000 lb per acre,

Plot No. 5, (Unmanured.) Yield 5,720 lb. per acre.

As will be seen from the above figures, in every instance the yield of the Nitrapo plots was much higher than the pen manure and control plots.

These results cannot, however, be taken as conclusive as it was only possible to conduct the experiments on a small scale, but they certainly point to the value of this fertilizer in onion cultivation. Further trials on a more extensive scale will be conducted in the forthcoming year.

The thanks of the Department are due to Mr. R. S. Cunliffe, B.Sc., Delegate, Chilean Nitrate Committee, Trinidad, for kindly supplying the Nitrapo for carrying out these experiments.

GRASSES.

Two excellent grasses for cattle have been recently introduced, namely Elephant Grass (*Pennisetum purpureum*) and Guatemala Grass (*Tripsacum daxum*). Both these grasses are growing well at the Experiment Station, and cuttings have already been distributed to interested planters in the Island.

These grasses withstood the drought of 1921 remarkably well.

The Elephant grass gives very good results on poor land, and does not require any special attention. Good crops may be reaped in about four or five months from the planting of the cuttings. The grass ratoons readily and may be cut about every three months.

SPECIAL INVESTIGATION BY AGRICULTURAL OFFICERS.

COTTON.

COTTON SELECTION.

During the year 1920-21, cotton selection work was concentrated on twelve of the best types of cotton grown at Skerretts, but which were originally selected from cotton grown on Yepton's estate.

On examination, it was noticed that Nos. 271-18, 276-2 and 278-2 compared very favourably with the parent plant.

In these three types the lint length (the lint being pulled from 5 seeds) did not fall below 50 mm. That of 278-2 averaged 54.4 mm. as against 52.5 mm. of the parent plant; but this increase may only have been due to better rainfall experienced during the maturing period of the bolls, as this character fell short the following season.

Careful attention is being given to this point as one of the objects in view is to obtain a strain with a long, fine staple, over 52 mm. for general distribution, as the strain grown throughout the Island is far below 50 mm. (See Table VI.)

1921-22.

On September 30, 1921, Nos 271-18, 276-2 and 278-2 were planted in progeny rows of 8 plants, 3ft. apart.

The following tables show the results of examination of the seed cotton reaped from plants selected on merit of their field characters.

TABLE I.
(FIELD CHARACTERS.)

No. of Plants.	Habit.	Height, ft.	No Bolls per Tree.	No. Bolls per Branch.	shape of Polls	Size of Bolls.	Distri- bution.	Resist- ance to Diseases.
278 2- 1	Good	5 $\frac{3}{4}$	260	12	Pointed	Large	Very Good	Free
278-2- 6	Good	5 $\frac{1}{2}$	190	9	Pointed	Fairly Large	Good	Free
276-2- 5	Good	5 $\frac{1}{2}$	224	12	Bulging and Pointed	Large	Good	Free
276-2- 14	Good	5 $\frac{1}{2}$	220	12	Pointed	Fairly Large	Good	Free
271-18- 1	Good	4 $\frac{1}{2}$	168	7	Pointed	Fairly Large	Fairly Good	Free

COTTON EXPERIMENTS.

TABLE II. (Laboratory Examinations).

SELF-POLLINATED FLOWERS.

No. of Plant.	Average Lint Length on 5 seeds.	Lint Index.	Lint per cent.	Seed Weight.	Available Fibre per cent.	Weak Fibre per cent.	Short Fibre per cent.
278-2-1	52.6	5.024	26.040	14.120	40.6	23.5	35.9
278-2-6	50.8	4.810	25.408	14.260	39.7	25.4	34.9
276-2-5	51.0	4.230	26.848	12.232	35.1	29.8	35.1
276-2-14	50.4	4.784	26.460	12.000	32.9	29.8	37.3
271-18-1	53.0	3.752	25.520	10.670	30.7	22.6	46.7

TABLE III. (Field Characters.)

No. of Plant.	Habit.	Height. ft.	No. Bolls per Tree.	No. Bolls per Branch.	Shape of Bolls.	Size of Bolls.	Distribution.	Resistance to Diseases.
278-2-25	Good	5½	207	8	Pointed	Fairly Large	Good	Free
276-2-20	Good	5¾	160	7	Pointed	Medium	Moderately Good	Free
271-18-1	Fair	4½	160	8	Pointed	Medium	Fairly Good	Free

TABLE IV. (Laboratory Examination.)

(Flowers un-selfed).

No of Plant.	Average Lint Length on 5 seeds.	Lint Index.	Lint per cent.	Seed Weight.	Available Fibre per cent.	Weak Fibre per cent.	Short Fibre per cent.
278-2-25	52.0	4.120	28.500	14.200	41.2	26.2	32.6
276-2-20	48.2	3.780	28.200	10.440	29.7	28.2	42.1
271-18-1	51.2	4.120	26.404	10.284	36.5	29.1	34.4

The figures in Table II are interesting inasmuch as the percentage of weak fibre is lower, and the lint length shorter than in examinations made in 1920-21. This, in all probability, is due to the prolonged drought experienced.

It has been decided to plant all the types mentioned in the above tables for future selections.

COTTON EXPERIMENTS.

The following table, showing the weight of lint per seed, and the number of bolls necessary to supply 1 lb. of seed cotton, may prove interesting.

TABLE V.

Weight of Lint per Seed in Mgs.

Type.	Weight of Lint, per seed	No. bolls equal to 1 lb. Seed-cotton.
278-2-1	42	126
278-2-6	49	126
276-2-5	42	116
276-2-14	47	116
271-18-1	39	...

For comparison with Tables II and IV, the following table showing the results of examinations of seed cotton grown on various estates throughout Antigua, is given.

TABLE VI.

No.	Lint Length.	Lint Index.	Lint per cent.	Seed Weight.	Available Fibre per cent.	Weak Fibre per cent.	Short Fibre per cent.
1	48.8	3.120	23.480	11.330	25.8	35.4	38.8
2	43.4	3.830	28.100	10.170	29.2	48.4	22.4
3	46.2	3.640	24.020	12.400	29.8	48.8	21.4
4	40.0	3.382	25.884	9.040	38.9	47.1	14.0
5	48.4	4.480	26.504	11.580	31.0	43.5	25.5
6	43.6	3.710	24.720	10.950	27.8	48.1	24.1

Work in Connexion with Insect and Fungus Pests and their Control

SUGAR CANE.

Grubs of the Brown Hard-back Beetle (*Lachnosterna Antiquae*) have been observed in large numbers in sugar cane fields situated in the Central Plain of the Island.

The parasite of this beetle, *Tiphia parallela*, has also been observed and in order to encourage this hymenopteron large numbers of *Cordia interrupta*, a host plant of the Tiphia, have been planted on certain estates where the brown hard-back beetle is prevalent.

The Moth borer (*Diatraea saccharalis*) and Weevil borer (*Sphenophorus sericeus*) were found in most cane fields, but no very marked damage is attributed to them.

COTTON.

Cotton worms (*Alabama argillacea*) were found in most cotton fields, but the attacks were very slight. They were easily kept in check by dusting with paris green and lime.

Adults of Cotton Stainers (*Dysdercus andreae*) were observed in all cotton fields, but were not nearly so plentiful as in the previous season. These were kept under control by setting traps with cotton seed and collecting by hand.

Leaf Blister Mite *Eriophyes gossypii* was observed towards the end of the season, but not so plentiful as in the previous year.

The Pink Bollworm (*Platyedra gossypiella*) was first discovered in Antigua during the year under review. It was found on May 21, 1921 attacking cotton on Yeptons estate, situated in the west of the Island (in District "A"), the infestation being estimated at $\frac{1}{3}$ per cent. All cotton was immediately destroyed, causing a loss of about 10 bales.

The close season for District "B" was declared from May 15 to June 15.

In this district, the pink boll-worm was first discovered on November 23rd., at Parson Mauls estate, in the east of the Island, but did no marked damage to the crop.

It was next observed, on December 1 at Crosbys estate, in the north of the Island, where a small area was planted in cotton. After a first picking the plants had to be burnt.

Shortly after, the pest was found at Brooks estate, in the south of the Island. The infestation was not great at the time of discovery but increased rapidly and only a first picking was obtained. The cotton plants were subsequently burnt at a loss of about 20 bales.

It was later discovered at Room's estate, near Parson Mauls, but the crop did not suffer to any noticeable extent.

In February 1922, it was again found at Yeptons estate. The infestation was at first small, but eventually increased and about 15 bales of cotton were lost.

The above report shows the rapid spread of the pest throughout the Island, in spite of the fact that the close season intervened between the destruction of cotton in District "A" and the planting of cotton in District "B."

An ordinance has been passed regulating the planting of cotton and providing for the daily fumigation of all cotton seed at the Ginnery, and a subsequent fumigation of seed intended for planting purposes, in the hope of keeping this pest in check.

LIMES.

Scale insects are generally found on lime trees. The following were observed during the year: the purple scale, (*Lepidosaphes beckii*), the orange snow scale, (*Chionaspis citri*) and the green scale (*Coccus viridis*).

SWEET POTATOES.

Scarabee (*Cryptorhynchus batatae*) was observed in most districts, especially on lands cultivated by peasants. Badly infected areas were covered with cane trash and burnt off, clean cuttings being supplied to the peasants by the Department.

Summary of Legislation in Antigua Affecting Stock and Crops.

ANIMALS.

Swine Epidemic Act 3 of 1893.—Gives extended power to Board of Health for the prevention of the spread of disease among animals,

City of St John's By Law 13 of 1897.—Registration of butchers and inspection of animals for slaughter or meat in market by Veterinary Surgeon and authorizes destruction of unwholesome food.

The City of St. John's By Law 13 of 1899.—City By Law for the purpose of dealing with cattle diseases.

City of St. John's By Law 2 of 1911.—Regulates the keeping of animals in municipal areas and inspection etc. of stables in the city.

Ordinance 7 of 1913.—An ordinance to prohibit the introduction of mon-goose into Barbuda.

Diseases of Animals Ordinance 16 of 1913.—Repeals and amends the law relating to contagious diseases among animals. Animals and diseases clearly defined. Inspectors empowered to visit and inspect estate premises etc., for diseased animals and to ensure that provisions are carried out. Suspected animals to be examined by Veterinary Surgeon and on his (positive) report shall be slaughtered.

Cruelty to Animals Amendment Act 3 of 1919.—Amends acts of 1880 and 1916 and provides a fine not exceeding £5 for anyone guilty of cruelty, beating ill-treating or starving any animal.

Ordinance 15 of 1919.—Importation of Foreign Animals. Sanctions prohibition by Order-in-Council of the landing in the Presidency of foreign animals or of any specified kind thereof. Repealed by Ordinance 8 of 1920.

Ordinance 8 of 1920.—The diseases of animals (Amendment) Ordinance 1920. An ordinance to amend further the Diseases of Animals ordinance 1913 States that the Governor may by Order-in-Council revoke, amend, or vary any Order-in-Council issued under the provisions of this section.

Ordinance 12 of 1920.—Exportation and Importation Prohibition Ordinance 1920. Sanctions prohibition of exportation and importation of any article by Order-in-Council (to include live and dead animals).

MILK.

Adulteration Act 6 of 1884.—Provides for examination of milk and also fines for adulteration in the island of Antigua.

City of St. John's By Law 1 of 1917.—Provides for the examination of milk and also fines for adulteration in the city of St. John's.

Ordinance 4 of 1919.—Adulteration ordinance amends sub-section 1 of Section 24 of the St. John's City Ordinance 1907 and provides that By Laws made for the purpose mentioned in the above ordinance of 1907 so far as may be necessary for affecting such purpose be made applicable throughout the Presidency.

By Law No. 1 of 1922.—A By Law ordained by the Saint John's City Commissioners to regulate the supply and sale of milk within the City of Saint John's.

PLANTS.

Plant Protection Act 4 of 1897.—Prohibits importation of Coffee or Coffee plants from Ceylon, Mauritius, Reunion, Fiji, Southern India, Sumatra, Java

PLANT LEGISLATION.

Natal, and other such places as may be proclaimed under the Act. Power to prohibit importation of other articles liable to introduce disease among plants and to seize prohibited importation.

Plant Fumigation Ordinance 5 of 1905.—To provide for the fumigation of the plants imported into the Presidency.

AGRICULTURAL PRODUCTS.

Agricultural Produce Protection Ordinance 1913.—Purchaser of Agricultural produce to have a license.

Cotton Traffic Ordinance 5 of 1906.—Regulates local traffic in cotton. No person to sell cotton (or purchase) without a license, purchaser to keep a purchase book.

Ordinance 9 of 1920.—Export duty Ordinance to impose a duty on sugar, molasses, cotton and syrup.

COTTON.

Proclamation of August 4 1917.—Prohibits importation of cotton seed and seed cotton into the Presidency from all countries outside the Leeward Islands except small quantities of seed specially imported with the permission of the Agricultural Superintendent.

Cotton Stainer Ordinance 8 of 1919.—Makes provisions for eradication of pest known as Cotton Stainer. (Repealed by Ordinance 7 of 1922).

Close Season Ordinance 10 of 1919.—Provides for the destruction of old cotton plants and regulates the planting of cotton. Period of close season of the different districts proclaimed annually. Repealed by Ordinance 7 of 1922.

Proclamation dated 9 December 1920.—Prohibits importation from all places of cotton seed, seed-cotton, lint, baling cloth or any article coming into direct contact with cotton produce.

Ordinance 7 of 1922.—The Cotton Protection Ordinance 1922. An ordinance to provide for the protection of cotton.

SUGAR CANE.

Proclamation of September 28, 1916.—prohibits the importation of cane plants or parts of sugar cane from Trinidad into the presidency of Antigua on account of Froghopper pests, *Tomaspis* spp.

Proclamation of 15 December 1920.—Prohibits the importation of cane from all places except under license given by the Governor (on account of spread of Mosaic disease).

Manufacture of Sugar. Act 108 of 1850.—An act to prohibit the use of acetate of lead in the manufacture of sugar in the Island.

CITRUS PLANTS, ETC.

Proclamation dated 5 March 1919.—Prohibits the importation into the Presidency of Antigua of Citrus plants and parts of Citrus plants including their fruits from British Guiana or any island or place in the West Indies other than Dominica, Montserrat, St. Lucia and Grenada.

Proclamation of September 28 1918.—Prohibits importation of rooted plants etc. of citrus family from United States of America, Jamaica, Cuba, Hayti and Santo Domingo unless accompanied by a certificate signed by a responsible inspection officer stating that the district from which they originate has not been affected by or has been free for the past two years of Citrus Canker.

COCONUTS.

Proclamation dated 27 February 1919.—Prohibits the importation of sprouted coconuts from Trinidad and Grenada, owing to the presence of Red Ring Disease.

Progress in The Chief Industries.

THE SUGAR INDUSTRY.

The season under review was a most anxious one for the Sugar Industry. Continued drought during the growing months of the crop caused the yield to be very much below the average.

The Directors of the Antigua Sugar Factory Ltd. in their annual report for 1921 state :—

'The crop season of 1921 has been the most anxious and difficult time since the Factory was erected. Occasionally in Antigua there is a year without "pond rains" and we are protected against drought from this by our ample water storage capacity, but the island has now gone through two years without "pond rains." Such a prolonged drought has not been experienced within the memory of the inhabitants. The want of water seriously interrupted the work of the Factory, in many weeks it could only manage half a week's work, and it had to stop entirely for a considerable time.'

The following figures, showing the results of the year's working in comparison with previous years, is also taken from the Director's annual report.

	1921	1920	Average of 1915-1919.
Canes	80,182 Tons	93,793 Tons	90,189 Tons.
Sugar	8,949 "	10,638 "	9,904
Sucrose in Cane	13.02 per cent.	13.02 per cent.	12.57 per cent.
Fibre in Cane	17.73 per cent.	16.90 per cent.	16.66 per cent.
Sucrose in Megass	3.13 per cent.	3.09 per cent.	2.79 per cent.
Purity of Juice	82.15 per cent.	82.92 per cent.	83.70 per cent.
Recovery of Sucrose in Cane	82.36 per cent.	82.02 per cent.	83.90 per cent.
Yield of Sugar	11.15 per cent.	11.35 per cent.	10.98 per cent.
Price of Sugar per ton ...	£26.8.3	£37.0.4	£19.13.5

The output of crystals by Bendals Factory only amounted to 1,516 tons, as compared with 2,450 tons in 1920-21.

THE COTTON INDUSTRY.

The area planted in cotton during 1921-22 shows a considerable decrease when compared with the previous year, as growers were advised to plant as small an area as possible, owing to the uncertainty of the cotton market.

The acreage planted was only 535, from which 100 bales (22,976 lb.) clean lint and 3 bales 699 lbs) stained were obtained.

The pink bollworm pest of cotton made its appearance during the year under review (See under "Insect pests and their control") and may be considered responsible for a loss of yield estimated at 30 per cent. In spite of this, the average yield of lint per acre throughout the Island was 68.5 lb., whereas the previous year it only amounted to 42.3 lb.

At the time of writing this report no sales have been realised for the above crop, but 457 bales of clean cotton, representing the Antigua crop for 1921 was sold locally at prices ranging from 2s. to 2s. 2d. per lb.

Fourteen bales of stained cotton are still in

Progress in Minor Industries.

THE CORN INDUSTRY.

Peasant growers planted a much larger area with corn (maize) than in the previous year, but owing to the prolonged drought, the first crop was an absolute failure. The second crop gave very fair yields but insufficient to supply local demands.

THE LIME INDUSTRY

This industry is practically at a standstill in Antigua. No fresh areas have been planted and owing to weather conditions the existing plantations are far from being in a healthy condition.

THE COCO-NUT INDUSTRY.

Plantations show signs of having suffered from the drought.

Growers report having suffered considerably from praedial larceny, and a Committee has been appointed to enquire into the matter and suggest remedial measures.

THE ONION INDUSTRY.

The area planted in this crop during the year compared favourably with the previous year. The onion seed from Tenerife arrived much earlier and up to the end of the period under review good prices have been realised for the first shipments.

Efforts in Connection With Agricultural Progress.

ANTIGUA ONION GROWERS ASSOCIATION.

The Committee of Management, which met every week during the season to direct the affairs of the Association, consisted of the following :—

A. P. Cowley Esq., M.B.E. (Chairman), Hon. A. E. Collens, F.I.C., N. S. Johnston Esq., R. S. D. Goodwin Esq., E. D. Dew Esq. and F. G. Harcourt, (Hon. Secretary.)

Owing to the depleted staff at the Botanic Station, Mr I. W. Thomas was appointed Manager of the Onion Drying House. He superintended all such operations as receiving, curing, packing and shipping, under the direct supervision of the Agricultural Superintendent.

The quantity of onions handled during the season, 148,128 lb., was considerably in excess of the amount received the year before. The total number of crates shipped was 2,428.

ONION & COTTON GROWERS ASSOCIATIONS.

Fair prices were realised at first but they rapidly declined in all markets, dropping as low as 2c. per lb. in Demerara.

The total price paid for raw onions to the contributing estates was 4.5c. per lb.

The following table shows the number of crates shipped to each market, and the gross and net prices realised.

Market	No. of Crates Shipped.	Gross Price per lb.	Net Price per lb.
		Cents.	Cents.
St. Lucia	25	5	4½
Trinidad.	980	2¾ to 10	1 to 8½
Guadeloupe	227	3½ to 11	2 to 9
Demerara	725	2 to 10	1½ to 8½
Barbados	220	3¼ to 4	2½
Martinique	100	8 to 10	7½
Grenada	126	5 to 5½	4½ to 5
Dominica	25	3	2½

Although the expenses for the year were heavy, yet the cost per crate shows a slight decrease on that of the previous year when the total cost was 131.9 cents.

The following table shows the various expenses per crate.

Onion House Expenses.

Labour	9.5 c. per crate.
Actual first cost of Crates shipped ...	44.0 „ „ „
Nail Account	3.6 „ „ „
Overhead charges	6.6 „ „ „

Total 63.7

Shipping Expenses.

Cartage	4.1 c. per crate.
Porterage & Lighterage ...	7.3 „ „ „
Freight	31.3 „ „ „

Total 42.6

Total Expenses per crate 106.3c.

This shows a first cost in drying expenses of 1.27 cents per lb., and a further cost in shipping of .85c. per lb., making a total cost per lb. of 2.12c. as compared with 2.65c. the previous year.

Antigua Cotton Growers Association.

During the season under report the Association provided peasants with selected seeds for planting purposes. The seed was selected under the supervision of the officers of the Agricultural Department and, as in former years, obtained from Yeptons estate, the property of the Hon. R. A. L. Warneford, Deputy Vice-Chairman of the Association.

Only 288¼ lb. of seed were sold for planting purposes.

The Association commenced the purchase of seed-cotton from the peasant growers on December 19 1921, the price paid from clean cotton being 6 cents per lb. Up to the end of March 1922, 13,627 lb. have been purchased.

Information concerning total purchase and sales will be published in the 1922-23 Report of the Agricultural Department.

Sugar-cane Experiments

Experiments in connexion with sugar-cane varieties were continued during the year, the following new varieties being introduced : B.12, B.S.F. 12-24, B.S.F. 12-27, B.S.F. 12-34.

The plant canes at Skerretts Experiment Station grew remarkably well, considering the drought, and were a source of attraction to several planters who visited the Station. The following Antigua varieties, Nos. 2, 410, 605, 310, 319, 327, 467, 550, and 575 attracted the attention of the managers of Cassada Garden, Fitches Creek and Donovans estates, and they have undertaken to give them a field trial next year.

From Skerretts Experiment Station, 45,200 cuttings were sold to planters, and sufficient planting material obtained for supplying the experiment plots conducted on various estates throughout the Island. The results of these experiments are contained in "Sugar-Cane Experiments in the Leeward Islands," compiled by the Government Chemist and Superintendent of Agriculture for the Leeward Islands and published annually.

Extension of Interest in Agricultural Matters.

ANTIGUA AGRICULTURAL AND COMMERCIAL SOCIETY

Regular monthly General meetings of the Society were held during the year and in addition one Special General and eighteen Committee meetings were held.

The average attendance was fairly good and many matters of interest were discussed, those receiving particular attention being :—

"Agricultural Research" by F. Hardy Esq., M A., Dip. Ag., Agricultural Research Chemist of the Imperial Department of Agriculture.

"Agricultural Problems of the Leeward Islands," by Hon. A. E. Collens, F.I.C., Superintendent of Agriculture for the Leeward Islands.

"Review of Results of Varietal Cane Experiment Plots, in Antigua, St. Kitts and Montserrat," also by Hon A. E. Collens, F. I. C. "Report on Triennial Conference, 1921, of the Associated West Indian Chambers of Commerce," by Hon. D. Mc Donald.

In January 1922 the Society held an "At Home" for Sir George and Lady Foster, in appreciation of their interest in West Indian affairs.

LAND SETTLEMENT IN ANTIGUA.

It is a pleasure to report that the allottees on Sawcolts estate continue to keep their lands in very good order. Officers of the Department pay periodical visits to the peasants and help them in every way possible.

The total area allotted to date is 71 11/40 acres, valued at £523 12s. 6d.

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Two students entered for the examinations in Practical Agriculture. One failed to satisfy the examiners, the other, Mr. E. S. Eldridge, obtained a 3rd Class pass in the intermediate Examination.

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Seven hundred and five letters were sent out from the Station and many minute papers were dealt with.

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Mr. F. H. S. Warneford, B. A., B. Sc., etc., Assistant Government Chemist for the Leeward Islands visited the Stations on March 2nd.

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METEOROLOGICAL RETURNS.

AVERAGE RAINFALL, 1874-1921.

In	1874	the	average	rainfall	on	41	Stations	was	31.16
"	1875	"	"	"	"	40	"	"	28.78
"	1876	"	"	"	"	36	"	"	41.98
"	1877	"	"	"	"	38	"	"	49.05
"	1878	"	"	"	"	53	"	"	47.11
"	1879	"	"	"	"	52	"	"	61.54
"	1880	"	"	"	"	46	"	"	49.68
"	1881	"	"	"	"	44	"	"	53.75
"	1882	"	"	"	"	45	"	"	33.01
"	1883	"	"	"	"	56	"	"	55.51
"	1884	"	"	"	"	56	"	"	43.98
"	1885	"	"	"	"	53	"	"	43.39
"	1886	"	"	"	"	55	"	"	47.78
"	1887	"	"	"	"	50	"	"	43.68
"	1888	"	"	"	"	47	"	"	44.23
"	1889	"	"	"	"	50	"	"	73.59
"	1890	"	"	"	"	45	"	"	33.00
"	1891	"	"	"	"	45	"	"	50.01
"	1892	"	"	"	"	53	"	"	38.43
"	1893	"	"	"	"	54	"	"	38.69
"	1894	"	"	"	"	68	"	"	38.85
"	1895	"	"	"	"	69	"	"	52.91
"	1896	"	"	"	"	56	"	"	59.85
"	1897	"	"	"	"	54	"	"	39.67
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"	1899	"	"	"	"	63	"	"	47.50
"	1900	"	"	"	"	64	"	"	36.95
"	1901	"	"	"	"	65	"	"	57.61
"	1902	"	"	"	"	71	"	"	58.80
"	1903	"	"	"	"	68	"	"	43.68
"	1904	"	"	"	"	70	"	"	37.01
"	1905	"	"	"	"	68	"	"	31.40
"	1906	"	"	"	"	66	"	"	53.93
"	1907	"	"	"	"	70	"	"	43.40
"	1908	"	"	"	"	72	"	"	43.79
"	1909	"	"	"	"	70	"	"	45.15
"	1910	"	"	"	"	70	"	"	34.77
"	1911	"	"	"	"	72	"	"	36.47
"	1912	"	"	"	"	72	"	"	32.20
"	1913	"	"	"	"	73	"	"	42.76
"	1914	"	"	"	"	72	"	"	36.86
"	1915	"	"	"	"	75	"	"	56.14
"	1916	"	"	"	"	74	"	"	58.23
"	1917	"	"	"	"	70	"	"	36.62
"	1918	"	"	"	"	70	"	"	37.37
"	1919	"	"	"	"	71	"	"	49.56
"	1920	"	"	"	"	70	"	"	30.09
"	1921	"	"	"	"	74	"	"	30.32

The average rainfall for forty-eight years is therefore 44.36 inches, and the average rainfall for 1921 is 14.04 inches below the average.

METEOROLOGICAL SUMMARY 1921.

19

Month.	Thermometer.				Relative Humidity, per cent.		Maximum.	Minimum.	Barometer Reading.		Wind.			Rainfall Botanic Station.	Barometer Corrected.		Thermometer.	
	Dry.		Wet.						Miles run.	Average.		Highest.	Lowest.		Highest Max.	Lowest Min.		
	9 a.m.	3 p.m.	9 a.m.	3 p.m.						Per day.	Per hour.							
	9 a.m.	3 p.m.	9 a.m.	3 p.m.	9 a.m.	3 p.m.			9 a.m.	3 p.m.	9 a.m.	3 p.m.	9 a.m.		3 p.m.	9 a.m.	3 p.m.	9 a.m.
January	83.5	85.3	73.1	72.8	67.4	61.6	-	68.5	30.131	30.049	5,140	164.5	8.2	3.79	30.191	29.978	-	66
February	80.3	82.7	73.1	73.6	65.1	61.1	-	60.9	30.116	30.020	5,475	195.5	8.1	0.75	30.158	29.944	-	67
March	80.2	82.1	72.8	73.1	66.2	61.0	-	70.1	30.104	30.024	6,600	212.9	8.9	2.41	30.162	29.912	-	66
April	80.4	82.7	74.7	75.4	73.9	67.7	-	69.5	30.089	30.024	5,050	168.3	7.0	1.58	30.155	29.956	-	66
May	83.3	85.9	75.7	76.8	62.5	61.6	-	70.0	30.053	29.980	4,375	141.1	5.9	1.76	30.109	29.919	-	69
June	84.3	86.6	75.9	76.6	63.4	57.7	-	70.7	30.070	30.011	5,730	191.0	7.96	1.48	30.157	29.959	-	68
July	83.8	85.6	75.8	75.9	64.6	59.4	86.7	69.8	30.117	30.069	6,925	223.4	9.6	6.27	30.186	30.010	89	64
August	83.6	86.4	75.3	76.7	63.5	58.9	87.5	69.5	30.063	29.996	4,450	143.5	5.97	1.73	30.166	29.934	90	65
September	85.1	86.0	77.2	76.7	63.8	59.8	88.7	62.3	30.005	29.933	3,720	128.3	5.3	4.39	30.071	29.879	93	56
October	83.8	85.4	76.5	76.6	67.1	61.3	86.8	59.4	29.959	29.872	3,950	127.4	5.3	6.51	30.007	29.822	88	54
November	81.5	83.3	75.9	76.1	74.5	69.6	84.7	69.8	30.001	29.970	3,800	126.6	5.4	3.57	30.113	29.842	87	59
December	80.9	82.7	75.7	76.5	75.6	70.7	83.8	71.4	29.996	29.900	3,400	121.4	5.0	2.64	30.043	29.821	86	70
Means for the year.	82.5	84.5	75.1	75.6	67.3	62.5	86.4	67.6	30.059	29.987	58,615	161.9	6.88	36.88				

Highest Maximum Temperature = 93° on 9th September. Lowest Minimum Temperature = 54° on 5th and 20th October. Highest Barometer (Corrected) = 30.191 on 12th January. Lowest Barometer (Corrected) = 29.821 on 21st December. Greatest Rainfall in 24 hours = 1.96 inches on 24th January. Greatest number of miles run by wind in 24 hours = 325 on 14th January, 29th June 7th, and 9th July. Earthquakes recorded = 6, on 25th March (2), 15th May, 16th July, 30th August, 22nd, December.

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February	80.3	82.7	73.1	73.6	65.1	61.1	-	60.9	30.116	30.020	5,475	195.5	8.1	0.75	30.158	29.944	-	67
March	80.2	82.1	72.8	73.1	66.2	61.0	-	70.1	30.104	30.024	6,600	212.9	8.9	2.41	30.162	29.912	-	66
April	80.4	82.7	74.7	75.4	73.9	67.7	-	69.5	30.099	30.024	5,050	168.3	7.0	1.58	30.155	29.956	-	66
May	83.3	85.9	75.7	76.8	62.5	61.6	-	70.0	30.053	29.980	4,375	141.1	5.9	1.76	30.109	29.919	-	69
June	84.3	86.6	75.9	76.6	63.4	57.7	-	70.7	30.070	30.011	5,730	191.0	7.96	1.48	30.157	29.959	-	68
July	83.8	85.6	75.8	75.9	61.6	59.4	86.7	69.8	30.117	30.069	6,925	223.4	9.6	6.27	30.186	30.010	89	64
August	83.6	86.4	75.3	76.7	63.5	58.9	87.5	69.5	30.063	29.996	4,450	143.5	5.97	1.73	30.166	29.934	90	65
September	85.1	86.0	77.2	76.7	63.8	59.8	88.7	62.3	30.005	29.933	3,720	128.3	5.3	4.39	30.071	29.879	93	56
October	83.8	85.4	76.5	76.6	67.1	61.3	86.8	59.4	29.959	29.872	3,950	127.4	5.3	6.51	30.007	29.822	88	54
November	81.5	83.3	75.9	76.4	74.5	69.6	84.7	69.8	30.001	29.970	3,800	126.6	5.4	3.57	30.113	29.842	87	59
December	80.9	82.7	75.7	76.5	75.6	70.7	83.8	71.4	29.996	29.900	3,400	121.4	5.0	2.64	30.043	29.821	86	70
Means for the year.	82.5	84.5	75.1	75.6	67.3	62.5	86.4	67.6	30.059	29.987	58,615	161.9	6.88	36.88				

Highest Maximum Temperature = 93° on 9th September. Lowest Minimum Temperature = 54° on 5th and 20th October. Highest Barometer (Corrected) = 30.191 on 12th January. Lowest Barometer (Corrected) = 29.821 on 21st December. Greatest Rainfall in 24 hours = 1.96 inches on 24th January. Greatest number of miles run by wind in 24 hours = 325 on 14th January, 29th June 7th, and 9th July. Earthquakes recorded = 6, on 25th March (2), 15th May, 16th July, 30th August, 22nd, December.



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